Review of the New Zealand Cot Death Study

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Outline

International comparisons
National data
Mortality reviews (case series)
The New Zealand Cot Death Study (case control study)
The prevention programme
Outcome
**International comparisons (per 1000 live births), late 1980s**

<table>
<thead>
<tr>
<th>Country</th>
<th>Postneonatal</th>
<th>SIDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Zealand</td>
<td>6.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Australia</td>
<td>4.2</td>
<td>2.2</td>
</tr>
<tr>
<td>UK</td>
<td>4.1</td>
<td>2.0</td>
</tr>
<tr>
<td>Sweden</td>
<td>3.1</td>
<td>0.8</td>
</tr>
<tr>
<td>Netherlands</td>
<td>2.9</td>
<td>0.7</td>
</tr>
<tr>
<td>United States</td>
<td>3.6</td>
<td>1.4</td>
</tr>
</tbody>
</table>
Post neonatal and SIDS mortality rates, New Zealand, 1968 -1987

(Mitchell et al, 1989)
National data

Number of deaths and rate (per 1000 live births)

Ethnic group
Gender
Age at death
Month of death
Birthweight
Gestation
Maternal age
Region

Fetal and Infant Deaths, annual. New Zealand Health Information Service, Ministry of Health

- SIDS rate/1000 live births
- Maternal ethnic origin
  - Non Maori
  - Maori
  - Pacific Island

(Borman et al, 1988)
SIDS: Age at death, 1986

(Number of deaths)

Age (months)

(NHSC, 1986)

(Number of Infants)


(NHSC, 1986)
SIDS

HEALTH DISTRICTS
IN NEW ZEALAND

SIDS 1-11 months
all codes
1979-82
NZ rate = 3.8 per
1000 live
births
Mortality review (case series)
Confidential enquiry into postneonatal deaths

Aims:
• Identification of preventable deaths
• Develop and recommend prevention strategies, thus reducing infant mortality at a local level

Methods:
• All cases were identified by the pathologist and checked against death certification
• Parents of cases were interviewed by medical officers using a semi-structured questionnaire
Auckland postneonatal mortality review, 1984-85

<table>
<thead>
<tr>
<th>Cause</th>
<th>Count (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIDS</td>
<td>80 (60%)</td>
</tr>
<tr>
<td>Congenital anomalies</td>
<td>24 (18%)</td>
</tr>
<tr>
<td>Infections</td>
<td>9 (7%)</td>
</tr>
<tr>
<td>Perinatal problems</td>
<td>8 (6%)</td>
</tr>
<tr>
<td>Total</td>
<td>134</td>
</tr>
</tbody>
</table>

Mitchell, 1987
Findings

Potentially preventable deaths were infrequent (n=14, 10%):
9 infective deaths
1 birth trauma
1 accidental displacement of tracheostomy tube
2 unrestrained road traffic crash
1 strangled between cot side and base
For SIDS cases the following notable factors were identified:

- Young mothers
- Maori
- Low socioeconomic group
- Poor accommodation
- Maternal smoking
- Male infant
- Poor antenatal care
- Low birthweight
The importance of some “notable factors” could not be interpreted:

- Co-sleeping (15%)
- Pallor, cyanotic or breathing problems, apnoeas (11%)
- Change in environment or routine (20%)

- Prone sleeping (Beal, 1978)
  66/108 (61%) found face down
  Interpreted as abnormality of baby who had not responded to partial respiratory obstruction.
NEW ZEALAND COT DEATH STUDY GROUP

Ed Mitchell
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John Thompson

Liz Allen
David Barry

Ian Hassall
Alison Roberts
Jan Brunt

Barry Taylor
Sheila Williams
New Zealand Cot Death Study: Cases

Died aged 28 days through to 1\textsuperscript{st} birthday
Study regions covered 80\% of all births in NZ
New Zealand Cot Death Study: Controls

Allocated a date of interview
Allocated an age
Date of birth calculated
Random allocation of obstetric hospital
Time of “sleep” randomly allocated

Thus controls are representative of all births and have an age distribution and time of “death” as expected for SIDS cases
## Study numbers

<table>
<thead>
<tr>
<th></th>
<th>Case</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>485</td>
<td>1800</td>
</tr>
<tr>
<td>Interviewed</td>
<td>393 (81%)</td>
<td>1592 (88%)</td>
</tr>
<tr>
<td>Obstetric records</td>
<td>471 (97%)</td>
<td>1773 (98%)</td>
</tr>
</tbody>
</table>
Position placed to sleep for last sleep

<table>
<thead>
<tr>
<th>Position</th>
<th>Case</th>
<th>Control</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back</td>
<td>4.7</td>
<td>15.7</td>
<td>1.0</td>
</tr>
<tr>
<td>Side</td>
<td>30.9</td>
<td>51.4</td>
<td>2.0 (1.2, 3.5)</td>
</tr>
<tr>
<td>Front</td>
<td>64.4</td>
<td>32.9</td>
<td>6.6 (3.9, 11.3)</td>
</tr>
</tbody>
</table>
Population attributed risk

Assuming prone sleeping position is causally associated with SIDS, then 47% of SIDS cases might be prevented if babies were not placed prone to sleep.
### Other major risk factors identified

<table>
<thead>
<tr>
<th>Factor</th>
<th>Case</th>
<th>Control</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
<td>64.8</td>
<td>31.0</td>
<td>4.1 (3.3, 5.1)</td>
</tr>
<tr>
<td>Not breastfed</td>
<td>31.5</td>
<td>16.2</td>
<td>2.4 (1.9, 3.0)</td>
</tr>
<tr>
<td>Bed sharing</td>
<td>24.0</td>
<td>10.5</td>
<td>2.7 (2.0, 3.6)</td>
</tr>
</tbody>
</table>
Interaction between maternal smoking and infant bed sharing

<table>
<thead>
<tr>
<th>Mother smoked</th>
<th>Bed sharing</th>
<th>Last two weeks sleep</th>
<th>Last sleep</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>1.4</td>
<td>1.5</td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
<td>1.7</td>
<td>1.0</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>3.9</td>
<td>4.6</td>
</tr>
</tbody>
</table>

Scragg et al, BMJ 1993
The risk increases with duration of bed sharing

<table>
<thead>
<tr>
<th>Duration</th>
<th>Non-smokers</th>
<th>Smokers</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>1.0</td>
<td>1.4</td>
</tr>
<tr>
<td>&gt;0 - &lt;2</td>
<td>1.7</td>
<td>3.3*</td>
</tr>
<tr>
<td>2 - &lt;5</td>
<td>1.4</td>
<td>4.0*</td>
</tr>
<tr>
<td>5+</td>
<td>2.5*</td>
<td>5.7*</td>
</tr>
</tbody>
</table>
The increased risk of SIDS with bed sharing is with maternal smoking rather than paternal smoking

<table>
<thead>
<tr>
<th>Mother smoked</th>
<th>Father smoked</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
<td>1.2</td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
<td>1.3</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>2.6*</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>1.6*</td>
</tr>
</tbody>
</table>
The amount smoked does not increase the risk of SIDS from bed sharing

<table>
<thead>
<tr>
<th>Mother smoked in the last 2 weeks</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>1.2</td>
</tr>
<tr>
<td>1-9</td>
<td>2.0 *</td>
</tr>
<tr>
<td>10-19</td>
<td>2.0*</td>
</tr>
<tr>
<td>20+</td>
<td>2.0*</td>
</tr>
</tbody>
</table>
The risk of SIDS associated with bed sharing and number of parents bed sharing

<table>
<thead>
<tr>
<th>Number of parents bed sharing</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>1.0</td>
</tr>
<tr>
<td>1</td>
<td>1.7*</td>
</tr>
<tr>
<td>2</td>
<td>1.5*</td>
</tr>
</tbody>
</table>

Risk is increased if bed sharing with older siblings (no data on twins sharing)
Pacifier use and SIDS

<table>
<thead>
<tr>
<th>Percentage using pacifier</th>
<th>Number subjects</th>
<th>Unadj OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case Control</td>
<td>Case Control</td>
<td></td>
</tr>
<tr>
<td>NZCDS, 1993</td>
<td>4.9</td>
<td>10.4</td>
</tr>
<tr>
<td></td>
<td>391</td>
<td>1586</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.44</td>
</tr>
</tbody>
</table>
In New Zealand cot death is the main cause of death for infants in the age group six weeks to one year. The present mortality rate is over four per thousand live births and cot death occurs almost twice as frequently in Maori infants.

The results from the first year of the New Zealand Cot Death Study indicate that the potential exists to reduce the number of sudden infant deaths in New Zealand.

The Department of Health in its concern to promote health for babies and their families has developed the Help Prevent Cot Death Programme to support the Cot Death Prevention Campaign. You'll be much fitter and healthier if you quit smoking and your baby will be too.
Help prevent Cot Death
He Mokopuna – He Taonga

Place baby on side or back to sleep.
Keep baby smokefree • Breastfeed

For more information contact:
• Plunket • Te Kohanga Reo • Parents Centre • La Leche League • doctor • midwife
• Maori Womens Welfare League • Area Health Board • nurse • Cot Death Society
Postneonatal and SIDS mortality rates (per 1000 live births)


Mitchell et al, 1993
Unique contribution of the NZCDS

• Initiated the recommendation to avoid the prone sleeping position (Back to Sleep, Reduce the Risk) worldwide
NZCDS explained the high Maori SIDS rate

The high Maori SIDS rate appears to be largely explained by the higher prevalence of maternal smoking (65% and 24% respectively) and bed sharing (21% and 8%) compared with non-Maori.

Univariate OR = 3.7
Adjusted OR = 1.3 (not significant)
Risk factors for SIDS not previously identified include:

• interaction between smoking and bed sharing
• the protective effect of pacifiers (dummies)
• the protective effect of sleeping in the same bed room as the parents
• smoking by the father
• postnatal depression
• described the epidemiology of SIDS after Back to Sleep campaign
NZCDS has confirmed

• the importance of thermal insulation
• duration and degree of breastfeeding
• symptoms of illness

NZCDS has excluded

• a causal relationship between SIDS and immunisations
• types of nappies and how they are cleaned
• travel in the preceding two days